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PATENT

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN THE APPLICATION OF:

JEFFREY ALAN HANKS

CASE NO.: KB4495 US NA

SERIAL NO.: 09/977,648

GROUP ART UNIT: 3635

FILED: OCTOBER 15, 2001

EXAMINER: STEVE M. VARNER

FOR: FIBER REINFORCED COMPOSITE SHEATHING FOR STORM PROTECTION

RESPONSE

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

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GROUP 3600

Sir:

Reconsideration is respectfully requested of the Office communication dated July 9, 2003 rejecting claims 1 to 17 under the provisions of 35 USC 103(a). In this response, no claims have been amended or cancelled since all claims under prosecution represent a patentable advance in the art.

Accompanying the present response is a Declaration of Jeffrey A. Hanks, the inventor of the present patent application. This Declaration sets forth headings directed to UNEXPECTED RESULTS, COMMERCIAL SUITABILITY and OFFICE REJECTIONS. The present response follows the headings in this Declaration.

UNEXPECTED RESULTS AND
COMMERCIAL SUITABILITY

As set forth in the Declaration, the inventor states that prior to his invention, a high strength fabric layer attached to a wall structure of structural sheathing (such as plywood) has been unable to withstand a 15 pound (33 kilogram) 2x4 missile (i.e., a nominal size 2 inch x 4 inch wood stand) propelled at a speed of 100 miles (161 kilometers) per hour in accordance with the test procedure set forth in the present patent application.

The inventor further states that prior art wall structures employing a high strength fabric layer would fail under the above noted test conditions due to either excessive deflection of the high strength fabric during impact or failure of framing holding the high strength fabric in place unless an excessive number of fabric layers were present.

A portion of unexpected results points to criticality in mounting the composite of the present invention with success or failure stated as follows:

- (a) when mounted in a building structure it is necessary for the structural sheathing (such as one half inch plywood) to FACE THE 15 POUND PROJECTILE such that the projectile impacts the structural sheathing before striking the composite of high strength fabric with resin having the recited deflection and
- (b) when mounted in a building structure failure occurs when the composite of high strength fabric with resin having the recited deflection FACING THE 15 POUND PROJECTILE such that the projectile impacts the high strength fabric with resin before striking the structural sheathing.

The inventor points out that in part (b) that reversal of the composition (i.e., the high strength fabric facing the 15 pound projectile) typically results in a hole completely through the composite wherein punching and tearing of the high strength fabric with resin occurs near the vicinity of impact by the projectile, followed by punching and splitting of the structural sheathing behind allowing the projectile to penetrate the building structure.

Thus, the inventor summarizes as follows:

That to summarize the previous paragraphs the composite of the present patent application when positioned in a building structure in accordance with the teachings of the present patent application results in success in deflecting a 15 pound projectile at 100 miles per hour but results in failure with the same composite reversed with a hole in the composite.

Also, at the beginning of page 4 of the Declaration, the inventor points to unexpected results as viewed by personnel of the Wind Engineering Research Center of Texas Technical University, which is the only known research institute known to the inventor, having a dedicated cannon to fire projectiles such as a 15 pound 2x4 projectile at 100 miles per hour. The inventor states that these personnel "EXPRESSED SURPRISE TO SEE SUCCESS OF MY LIGHTWEIGHT COMPOSITE WHEN THEY HAD NOT SEEN THIS SUCCESS IN WALL SYSTEMS WITH SIMILAR WEIGHT CHARACTERISTICS AND HAD NOT SEEN WOOD FRAMED, METAL OR CONCRETE SYSTEMS REFLECT THE PROJECTILE BACKWARD WITH SUCH INTENSITY." (emphasis added)

Furthermore, the inventor states in the section, COMMERCIAL SUITABILITY, that his employer, E. I. du Pont de Nemours and Company, Inc., has begun commercially

marketing of the composites for use in building structures to withstand debris from tornado force winds.

OFFICE REJECTIONS

The rejection of all claims under 35 USC 103(a) is respectfully traversed based on a combination of Simpson USP 4,822,657 in view of Green USP 6,089,300.

The Office rejections set forth the following conclusions which are likewise noted in the accompanying Declaration.

It would have been obvious to one of ordinary skill in the art at the time the present invention was made to have high strength fibers bonded with a resin as in Green in the fabric of Simpson to increase the strength of the panel.

...

It would have been obvious to one of ordinary skill in the art at the time the present invention was made to use polyethylene, aramid, and glass fibers as in Green in the structure of Simpson to strengthen the fabric.

...

Regarding claims 9-10, the integral portion used for a wall or a ceiling are obvious design choices to put the panel in places it would be useful.

As supported by the Declaration, Simpson is considered non-analogous art since the patent disclosure is directed to bullet and similar projectile protection which totally differs from the test procedure employing a significantly higher mass, i.e, 15 pounds, at a speed of 100 miles per hour. In similar fashion, Green, likewise is considered non-analogous art since "the combination of mass and projectile speed of this publication totally differs from the mass of a 15 pound projectile as [sic] a speed of 100 miles per hour."

However, solely for purposes of argument in this Declaration, it is assumed that the combination of Simpson and Green is proper. However, it is directly considered that the rejection must fail. This assumption for purposes of argument is that the Simpson high strength material was bonded. As stated in the accompanying Declaration, Jeffrey A. Hanks, states:

“That I consider such structure, EVEN IF THE HIGH STRENGTH MATERIAL OF SIMPSON WERE BONDED, to be unsatisfactory and not lead to my invention for a number of reasons:

(a) the statement in the Office action “to increase the strength of the panel” in Simpson inherently would lead to **increased rigidity within the panel**; yet in my invention **flexibility is of paramount importance** under the test conditions of a 15 pound (33 kilogram) projectile at a speed of 100 miles (161 kilometers) initially striking structural sheathing (such as plywood) results allowing my high strength fabric to **deflect** in a range of 5.0 to 17.5 centimeters **with the projectile bouncing in an opposite direction from the direction of impact.**

(b) the Office position does not take into account the disclosure of Simpson on column 4, line 14 to 16 which states:

The number of fabric layers and thickness of the fabric layer 33 may be varied depending upon the level of protection desired.

since such disclosure does not allow one to derive my invention; illustratively the examples in my patent application employ an extremely thin layer of Kevlar® aramid of 0.060-inches thick, consistent with a need for flexibility in contrast to a number and presumably thick layers for increased strength in Simpson if modified consistent with the Office position.

(c) for reasons stated in part (a and b), I consider that there is no teaching which would allow one in the art to derive my invention from a modification of Simpson including my result never achieved before in a lightweight composite.”

Therefore, to summarize the traversal of the inapplicability of the combination of publications, flexibility is of paramount importance under the test conditions of the present invention versus increased rigidity of Simpson in accordance with the statement of the Office action “to increase the strength of the panel”. The Declaration sets forth in detail that Simpson on column 4, lines 14 to 16 discloses use of a number of fabric layers and thickness which “may be varied depending upon the level of protection desired”. This disclosure would lead away from the present invention when combined with Green.

The inventor points out that examples in the patent application employ an extremely thin layer of Kevlar® aramid, namely 0.060 inches thick.

The present response repeats again the inventor’s conclusion in part (c) of the previous quote:

“I consider that there is no teaching which would allow one in the art to derive my invention from a modification of Simpson

INCLUDING MY RESULT NEVER ACHIEVED BEFORE IN A
LIGHTWEIGHT COMPOSITE." (emphasis added)

SUMMARY

The present response traverses the rejections based under 35 USC 103(a). In support of such traversal, a Declaration of Jeffrey A. Hanks, the inventor points to error in the Office position.

Withdrawal of the Office rejections is considered proper. A notice of allowance is solicited.

Respectfully submitted,



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Dated: November 7, 2003

Encl - Declaration